

IN THE SPECIFICATION:

At page 1, after the title insert the following paragraph:

– This application is a national phase under 35 U.S.C. § 371 of International Application No. PCT/AU2004/001841, filed December 23, 2004 which is incorporated by reference herein. –

At pages 2 to 7, delete paragraphs [0004] to [0017] and insert the following paragraphs therefor:

[0004] Accordingly, the present invention provides a panel or object construction including an inner support frame means and an outer skin at least partially enclosing said support frame means formed at least in part by at least one layer of at least one flexible web wound about said support frame means at least partially overlapping a previously positioned said flexible web whereby at least some overlapping regions of a said web or webs are adhered to each other. Preferably, a plurality of said layers are formed whereby at least some of said layers are adhered to at least one other said layer. Preferably, the outer skin retains flexibility after being applied to the support frame means and also provides some tension to or pressure on the support frame means. Preferably the outer skin may fully enclose the support frame means. Preferably, at least one said flexible web may be a plastics film. The flexible web or webs may be wound in at least two directions disposed at different angles to each other, preferably at substantially 90°. Conveniently, the or each flexible web utilized might be an oriented plastics film, stretched plastics film or a plastics film pre-stretched beyond its yield point but retaining some memory whereby it will constrict on the support frame means after application. A linear low density polyethylene film material pre-stretched in this manner is suitable (but not essential) for the performance of this invention. Conveniently, the outer skin may be made

completely of one or more flexible plastics film webs, or it may be made of plastics film web and at least one other web, for example of a reinforcing mesh or other material. Such other material may include rigid or semi-rigid panels such as plywood, panels, such panels might be positioned within the wound plastics material film or on either side of same to provide increased strength if required. The object or panel construction accordingly may provide, depending on the embodiments utilised, a relatively lightweight panel construction that is inexpensive to produce and which may be water or liquid proof and may also provide protection for the goods that might be packed in a container utilising such panel constructions. In one preferred embodiment the inner support frame means may define an internal free space region within the outer perimeter dimensions of same with the outer skin substantially enclosing said internal free space region. The outer skin may be water or liquid proof such that water or liquid cannot enter the internal free space region, or in the alternative, and preferably if inlet / outlet means is/are provided, the internal free space region may be adapted to contain water or some other liquid. It will of course be recognized that the same feature might provide the inlet and the outlet to the internal free zone region. The inlet / outlet means are preferably re-sealable by any suitable means. Conveniently the inner support frame means may be formed in or parallel to a flat plane, or alternatively may be three dimensionally formed. Conveniently the support frame means includes convex curved surfaces facing outwardly of the internal free zone region.

[0005] In a further possible arrangement, the internal free space region might be filled or partially filled with a polyurethane, polystyrene (or similar) plastics foam material rigid or semi-rigid panel prior to the outer skin being formed. Alternatively the internal free space region might be filled with an injected plastics material foam (such as polyurethane, polystyrene or the like) after the outer skin has been formed.

[0006] As used in this specification, the terms "support frame means", "frame element" and the like are intended to convey a meaning of both a continuous support element such as, for example, a sheet of corrugated cardboard or similar, or an open frame with an outer perimeter support defining a largely open space in between, either being generally planar in form or three dimensional in form.

[0007] Conveniently the support frame means may be a single frame element or may be at least two frame elements, the or each said frame element being spaced apart and wound by said flexible web or webs such that the flexible web or webs between adjacent frame elements forms a hinge means. When a single frame element is used, the single frame element may include at least two parts interconnected by hinge means.

[0008] In one preferred arrangement, the object or panel construction is passed through or by heating means to heat shrink the flexible plastics film onto said support frame means. In a further preferred arrangement air is trapped and retained within the outer skin or alternatively, the outer skin is perforated at one or more locations to allow air flow therethrough.

[0009] The flexible plastics film web or webs may include self adherent characteristics, or a separate adhesive or adhesive layer is used to adhere the layers of the flexible web or webs together. Conveniently the support frame means may include a perimeter substantially rigid frame formation defining a substantially open space inwardly of the perimeter rigid frame formation. Preferably, the perimeter rigid frame formation may include a portion with an outer edge zone adapted to form at least one bevelled edge region when the outer skin of the plastics film web or webs has been wound thereon. The aforesaid bevelled edge region may extend fully around the perimeter frame formation.

The perimeter rigid frame formation may also include a portion with an outer edge zone adapted to form a convex curve when the outer skin of said web or webs has been wound thereon. In yet another preferred embodiment the perimeter rigid frame formation includes a portion with an outer edge zone adapted to form a square or rectangular edge form when the outer skin of said web or webs has been wound thereon.

[0010] In another possible embodiment a printed sheet may be sandwiched between inner layer or layers and an outer layer or layers of the outer skin, at least the outer layer or layers being transparent whereby said printed sheet is viewable.

[0011] In still further preferred embodiments, a plastics foam material may be located within the outer skin, or alternatively a rigid or semi-rigid panel might be located either within the outer skin, between layers of the outer skin, or outwardly of the outer skin.

[0012] In accordance with a further aspect, the present invention provides a graphics display panel including a rigid inner support frame means and an outer skin enclosing said support frame means formed at least in part by at least one layer of at least one flexible plastics film web wound about said support frame means at least partially overlapping a previously positioned said flexible plastics film web whereby at least some overlapping regions of a said flexible plastics film web or webs are adhered to each other, and graphics indicia being carried on an outer surface of said outer skin. Preferably the graphics indicia are printed on or otherwise formed on a separate sheet adhered to said outer surface of said outer skin.

[0013] According to a still further aspect, the present invention provides an evaporation restrictor panel including a rigid inner support frame means and an outer skin formed at least in part by at least one layer of at least one flexible plastics film web wound

about said support frame means at least partially overlapping a previously positioned said flexible plastics film web whereby at least some overlapping regions of a said flexible plastics film web or webs are adhered to each other.

[0014] According to yet another aspect of the present invention there is provided a desalination apparatus including a rigid inner support frame means and an outer skin enclosing said support frame means formed at least in part by at least one layer of at least one flexible plastics film web wound about said support frame means at least partially overlapping a previously positioned said flexible plastics film web whereby at least some overlapping regions of a said flexible plastics film web or webs are adhered to each other, said support frame means and said outer skin defining a sealed internal zone having inlet and outlet arrangement means to introduce and remove water to be desalinated to and from said internal zone, said outer skin having at least one upper region upwardly inclined from at least one hollow zone of said support frame means, said support frame means further including water collection and drainage means to collect pure water condensed on said upwardly inclined region and deliver same to said at least one hollow zone of the support frame means.

[0015] The present invention also anticipates utilizing panel constructions as described above in an assembled form to provide a container or a wall construction for various applications.

[0016] Conveniently a container made from the aforesaid panel constructions might include a plurality of said panel constructions connected together via hinge means such that the container can be transported in a substantially flat condition and erected into said container by an end user. Preferably releasably fastening means may be provided to enable said panel constructions intended to form adjacent said side walls to be

releasably connected to each other. At least one of the panel constructions might include a printed sheet outwardly covered and retained by at least one layer of a transparent flexible plastics material web. The said at least one layer of a transparent plastics material web may also form an over wrap to connect and hold the panel constructions in an erect container configuration.

[0017] A wall construction element may be provided by utilizing at least one rectangular shaped panel construction as described above further including retainer means engaging and retaining at least one opposed edge of said panel construction. Conveniently, at least three edges of the panel construction are held by said retainer means. Conveniently a container arrangement might be formed on a pallet base including a plurality of wall construction elements as aforesaid.

[0018] In another possible arrangement a wall construction element might be provided including at least one rectangular shaped panel construction as described above further including one or more rigid or semi-rigid material sheets connected to the inner support frame means and substantially covering the whole of at least one side face of the panel construction.

[0019] According to a still further aspect of this invention there is provided a panel construction including an inner support frame means and a flexible outer skin at least partially enclosing said support frame means formed at least in part by at least one flexible web wound about said support frame means in at least partially overlapping manner whereby at least some overlapping regions of said web or webs are adhered to other, said support frame means having two mutually parallel first frame members spaced from one another with each said first frame member having at least one hinge zone such that the hinge zones in the spaced first frame members are arranged in at least one pair

with the or each said pair defining a hinging axis about which portions of the first frame members on either side of said hinge zones can be positioned into differing relative dispositions, after having said flexible outer skin applied to said inner support frame means.

[0020] A panel construction as defined in the preceding paragraph may include a second frame member connected and secured to said first frame members at or adjacent the or each said pair of hinge zones. The panel construction may further include at least one additional said first frame member located intermediate said two mutually parallel and spaced said first frame members, the or each additional said first frame member also including a hinge zone aligned with each said hinging axis. Conveniently each said hinge zone maintains the portions of the first frame members on either side of the hinge zone in a fixed relative position until an external force is applied to change the fixed relative position to a new fixed relative position. Preferably each said hinge zone includes a crease line or a region of reduced thickness relative to the portions of the first frame members on either side of the hinge zone. Preferably, each said hinge zone permits substantially free movement of the portions of the first frame members on either side of the hinge zones about said hinging axis or axes at least within a predetermined arc of movement. The panel construction may further include abutment means arranged to limit movement of the portions of the first frame members on either side of the hinge zones about the hinging axis or axes to a predetermined arc of movement. In a further embodiment there may be provided an end frame member joining and connected to end portions of the two mutually parallel and spaced said first frame members to form a substantially rectangular said inner support frame means. Preferably, the outer flexible skin includes at least one first layer of a flexible plastics material film web wound about said

end frame members. The film web may have a width to at least span the distance between said two mutually parallel and spaced first frame members. The outer flexible skin may further include at least one second layer of a flexible plastics material film web helically wound in overlapping manner about the two mutually parallel and spaced said first frame members. The aforesaid first layer may form an outer surface of the outer flexible skin.

[0021] The aforesaid panel construction may further include pressure equalizing means to ensure pressure within the outer flexible skin is the same as atmospheric pressure. Conveniently multiple said hinging axes may be provided, all of said hinging axes being mutually parallel to each other. In another possible embodiment some of the hinging axes might be disposed perpendicularly to other of said hinging axes. Preferably portions of the first frame members are moved about the hinging axes to position free end edges of the panel construction adjacent one another.

[0022] The present invention also provides a flat panel assembly including a plurality of separate substantially rigid perimeter frame formations each defining a substantially open space inwardly of said substantially rigid perimeter frame formation, and an outer envelope formed by at least one layer of a flexible plastics film web material wound about all of said frame formations to at least partially overlap a previously laid length of the flexible plastics film web material with at least some overlapping regions of said web material being adhered to one another.

[0023] Conveniently, each said separate substantially rigid perimeter frame formation is individually wound and at least partially enclosed by at least one layer of at least one flexible plastics film web to form an individual panel whereby at least some overlapping regions of said web or webs are adhered to one another. Each said separate rigid perimeter frame formation may be fully enclosed by said flexible plastics film web.



Conveniently, a first said frame formation is square or rectangular and at least one further said frame formation is positioned with an edge adjacent a respective edge of said first frame formation.

[0024] The outer envelope may be formed by successively winding layers of said plastics film web material in a first direction and thereafter in a second direction disposed at an angle (preferably at 90°) to said first direction.

[0025] A flat panel assembly may also be provided including a plurality of panel constructions as described above arranged adjacent each other substantially in a plane, and at least one continuous layer adhered to one side only of said panel constructions.

[0026] Conveniently said at least one continuous layer is made up of at least two overlapping webs adhered to one another in the overlapping zone. Preferably a container is formed from a flat panel assembly as aforesaid where one said panel construction forms a base of the container and the other said panel constructions form side walls of the container, the continuous layer forming a seal between adjacent edges of adjacent side walls and between adjacent edges of the base and the side walls of the container. In another preferred embodiment a container may be made from a flat panel assembly as described above wherein one said frame formation forms a base of said container and the other said frame formations form side walls of said container, said outer envelope forming a seal between adjacent edges of adjacent side walls and between adjacent edges of the base and the side walls of the container.

[0027] The present invention also provides apparatus for wrapping a support frame means with an outer skin formed at least in part by a plurality of layers of a flexible web wound about said support frame means, said apparatus including a first

conveying means and a second conveying means, the first and the second conveying means being arranged to move the support frame means to and fro between the first and second conveying means, and a roll of said flexible web disposed between the first and the second conveying means being movable between a relatively elevated position and a relatively lowered position, the flexible web being successively positioned along a first face of the support frame means with the roll of said flexible web in the elevated position as the support frame means moves between the first and the second conveying means, whereupon, the roll of said flexible web moves to the lowered position and the flexible web is positioned along a second face of the support frame means opposite to said first face as the support frame means moves again between the first and the second conveying means.

[0028] In the aforesaid apparatus, at least one of said first or said second conveying means is bodily repositionable about a rotation axis disposed at  $90^\circ$  to the plane of movement of the support frame means between the first and the second conveying means. Conveniently a third conveying means may be provided to move the support frame means in a direction  $90^\circ$  to the direction of movement between the first and the second conveying means, the third conveying means being cooperable with the first or the second conveying means that is bodily repositionable about said rotation axis, a second roll of flexible web being mounted for selective movement between elevated and lowered positions and disposed between said third conveying means and the first or the second conveying means that is bodily repositionable about said rotation axis. At least two rolls of a said flexible web may be positioned between the first and the second conveying means, each of said rolls being movable between a said elevated position and a said lowered position. Conveniently, the roll is movable in an axial direction as the flexible web is

applied to the support frame means.

[0029] In accordance with another aspect, the present invention also provides apparatus for wrapping a support frame means with an outer skin formed at least in part by a plurality of layers of a flexible web wound about said support frame means, said apparatus including a first conveying means and a second conveying means being arranged to move the support frame means between the first and